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ABSTRACT

An integrated microfabricated instrument for manipulation, reaction and detection of microliter to picoliter samples. The instrument is suited for 5 biochemical reactions, particularly DNA-based reactions such as the polymerase chain reaction, that require thermal cycling since the inherently small size of the instrument facilitates rapid cycle times. The integrated nature of the instrument provides 10 accurate, contamination-free processing. The instrument may include reagent reservoirs, agitators and mixers, heaters, pumps, and optical or electromechanical sensors. Ultrasonic Lamb-wave devices may be used as sensors, pumps and agitators.